Environment pollution and its impact on the incidence of Morbidly and Mortality pattern: A case of Mumbai metropolitan of India

Environment pollution is one of the major problems faced by the population in today's world. The basic objectives of this paper are to examine environment pollution and its impact on incidence of Morbidly and Mortality pattern in Mumbai. Data on air pollution have been taken from various sources. Data on vehicular mode of transport obtained from Motor Transport Statistics of India. Both Mortality and Morbidity data was collected from Department of Municipal Corporation of Mumbai. Both Mortality and morbidity and their trends are examined through time series data; and seasonal variations in air pollution computed from month data. Result shows that increasing level of air pollution causes not only respiratory diseases but also deaths related with such diseases increasing. Realizing the danger of rising pollution on health status of people, government should make special efforts to bring about awareness among people for a collective action to solve this problem.

Context

The world is becoming increasingly urbanised. The urban population of the world as a whole has been expanding at the rate of nearly 3% per year, presumably faster than the existing world population growth rate. Roughly, half of the global population lives in cities (Peterson, J., 1984). Presently approximately 30% India's population lives in urban areas. The current trends of urbanization inspired by better quality of life are posing multiple stresses on our environment. Couple with rapid urbanization, each city consists of a large number of constituent systems. Environment pollution is one of the major problem faced by the population in today's world, especially in the cities of the developing countries which not only experiencing a rapid growth of population due to increasing rate of rural urban migration but also uncontrolled industrialization and its accompanied by growth in number of vehicles. In these cities the municipal services, such as water supply and sanitation, drainage of storm water, treatment and disposal of wastewater, management of solid and hazardous water, supply of adequate and safe food and housing, and are all unable to keep pace in urban growth. All these in turn lead to an increase in the pollution levels. Also unplanned location of industries in and around the urban areas is followed b improper traffic. Indian cities are faced with the challenge of power, resources and trained personnel to provide their rapidly growing population with clean drinking water, sanitation, sustainable transport system and other facilities. The result is mushrooming illegal settlements and slums, increased overcrowding, poor transport facilities, pollution, and rampant diseases linked to an unhealthy environment. The proportion is significantly higher in cities like Mumbai, Calcutta and Delhi. Along with over-crowding, Indian cities are filled with automobiles like scooters and private cars, buses and inappropriate industrialization. It is to be realized, in general, that there are neither resources nor-given rapid technological change- the time to allow the damage to environment now and clean up later.

Objective

The two broad objectives of this paper are to

1. To examine the trend in the level of air pollution in Mumbai in terms of three major air pollutants, Sulphur Dioxide (SO_2), Nitrogen Oxide (NO_2), and suspended particulate

matter (SPM) and to analyze the principal cause of air pollution considering the growth industrial units as well as number of vehicles.

2. To examine the trend in water pollution.

3. Lastly to examine the relation between the trend of Morbidity and Mortality of respiratory diseases with air pollution and water borne diseases with water pollution respectively.

Data Base

Secondary sources of data have been largely used for this analysis. The data on air and pollution have been taken from the compendium of environment statistics, CSO, Ministry of statistics and programme implementation, government of India and from the publications of the Central pollution Control Board. Data on the vehicular mode of transport have been obtained from Motor Transport Statistics of India. Data on both Mortality and Morbidity was obtained from the Department of Municipal Corporation of Mumbai. Both Mortality and morbidity and their trends are examined through time series data and seasonal variations in air pollution are computed based on month's data.

Methodology

The paper tries to analyze the above mention objectives the area of Mumbai Metropolitan city of India Analytical and Statistical techniques have been used for interpretation and data representation.

Major Findings

Table1: Population Growth and Urban Growth in India

Year	No. of Towns	% of Urban Pop^n / Total Pop^n	Growth Rate	Average Annual Growth Rate	Tempo of Urbanization
1901	1827	10.84	-	-	-
1911	1815	10.29	0.35	0.03	0.60
1921	1949	11.18	8.27	0.79	0.80
1931	2072	11.99	19.12	1.76	0.80
1941	2250	13.86	31.97	2.87	1.68
1951	2843	17.29	41.42	3.52	2.65
1961	2365	17.97	26.41	2.30	0.40
1971	2590	19.21	38.23	3.28	1.28
1981	3378	23.34	46.14	3.68	1.83
1991	3768	25.74	36.19	3.16	1.37

Source: Census of India 1991

At present, the number of metropolitan cities in India has reached the figure of 40 in 2001. Delhi population in 1991 stood at 93.7 lakhs, showing an increase of 31.5 lakhs over the 1981 figure. According to census of India (2001), Delhi's population has reached the figure of 137,82,976. The city of Chennai has reached a growth rate of 41.05% and the population has reached the figure of 4216268 (Census, 2001). Kolkata and Mumbai on the other have marked the entire domain, range and scope of problems arising out of unbridled urban growth.Population growth coupled with urbanization causes over-crowding, environmental pollutions, health problems and civil amenities, transportation, etc stretched to almost disrupting edge.

The World Health Organization defines air pollutions as Subsistence put into the air the activity of man kind in to concentration sufficient to cause harm ful effects, property, crop yield or to interface with the enjoyment of property. Some of the most important air pollutants are suspended particulate matter SPM; nitrogen oxides (NO_x); carbon monoxide(CO); Lead; Sulpher dioxide (SO_2) etc

Table2: Main Sources and health effects on of pollutants.

Pollutant	Main Sources	Health Effect
SPM	Ceramic and glass; thermal power	Damage of lungs, May cause bronchitis and asthma
SO_2	Thermal power; chemical; ceramics; textiles	Acid rain, damage to lungs, eye, skin
NO_x	Diesel engines; ceramics	Form Smog damage to respiratory system and eye irritation
CO	Two wheelers; engineering	Toxic causes blood poisoning
HC	Two wheeler; ceramics. Chemicals	Cancer
Lead	Petrol; engines, water pipes, food cans, batteries	Nervous system slow down ad brain development is retarded; slow reaction time.

Source: *Pollution Monitoring and Technical Corporation Division. New Delhi. 1995*

Vehicular Growth and Air and Noise Pollution:

The problem of pollution have been increasing leaps and bounds over the past few decades as a result of urbanization and faster rate of motorization, particularly due to enormous increase in personal mode of transport. Table 2 indicates that the vehicular population has increased by 91 times during 1991-96 (Motor Transport Statistics of India, 1997), as against 2.5 times increase in human population during the same period. Hence, as inference can be drawn that the road transport scenario is worsening in India in the preceding decades.

The composition of vehicles represents that the Indian roads are crowded by 50-80% two wheelers and cars. Public transport accounts for a meager 2%. In majority of the Indian cities the private mode of transport is increasing at the rate of 10-18% per year. With the increasing urbanization and industrialization, the transport demand has also increased consequently

Table3: Vehicular Growth in India

Year	Vehicular Pop^{n} (0.1 million)	Human Pop^{n} (in million)	No. of Vehicles / 0.1 million of Pop^{n}
1951	3.06	361.1	85
1961	6.65	439.2	151
1971	18.65	548.2	340
1981	53.91	683.3	789
1991	213.74	846.3	2526
1992	235.07	859.7	2734
1993	252.99	873.3	2897
1994	277.67	890.1	3119

Source: Motor Transport Statistic of India 1997.

Population growth coupled with urbanization causes over-crowding, environmental pollutions, health problems and civil amenities, transportation, etc stretched to almost disrupting edge.

Impact of pollution on the Trend of Morbidity and Mortality Pattern

The result shown that the increasing levels of air pollution cause the number of people suffering from respiratory diseases and leading to death. Among them prevalence of Asthma in the chronic diseases in aged age group of people and among children. With the growth of vehicle creates another threats to common life . The realizing the danger of rising pollution on the health status of the people, the government should make special efforts to bring about awareness among the people for a collective action to solve this problem.

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